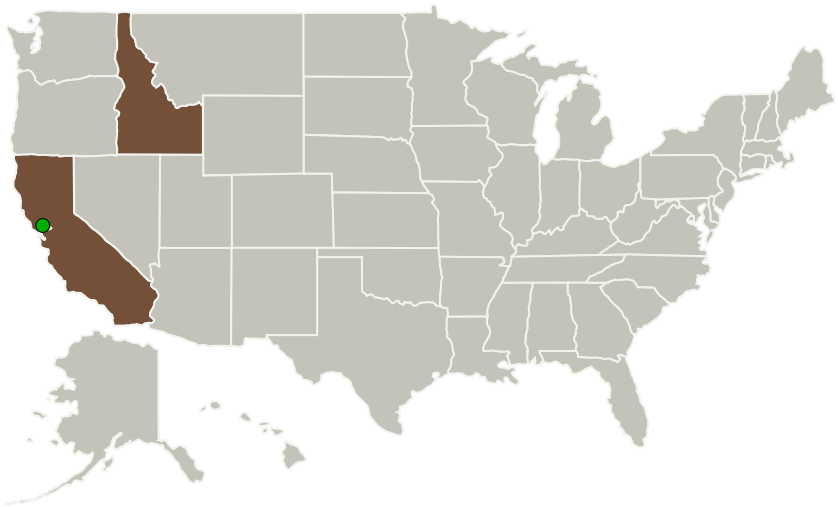
# Passive New UV Polarimeter for Remote Surface and Atmospheric Sensing, Phase I

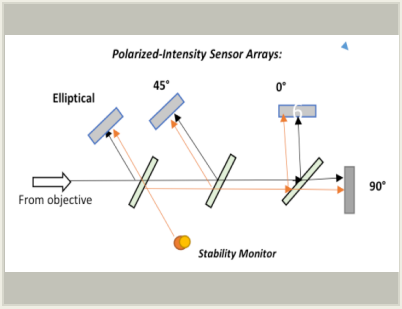
Completed Technology Project (2016 - 2016)

## Project Introduction

Our imaging polarimeter concept makes available for the first time, the passive remote imagery of all four Stokes vector components at UV wavelengths shorter than 450 nm over relatively large fields of view. This new instrument will enable the scientific community to expand atmospheric and oceanic research and monitoring applications, and to advance lunar and interplanetary exploration horizons. The new architecture is based on the use of polarization-analyzing components made with custom thin-film optical coatings. As a result of this new approach, wavelengths shorter than 400 nm can be readily analyzed, and simultaneous measurements can be accomplished without the need for birefringent, electrically modulated parts, or moving components. The unique architecture is well suited for extended space missions because it satisfies low power and weight budget requirements, has inherently high radiation tolerance, and uses photometrically stable passive components to insure extended operational life. It incorporates a built-in photometric stability monitoring system. The Phase I effort will refine the design concept and optics components, and a proof-of-concept device will be build and performance will be evaluated. The majority of components are off-the-shelf. Results will be applicable to the construction of a prototype in Phase II.

## Primary U.S. Work Locations and Key Partners



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## Table of Contents

**Small Business Innovation Research/Small Business Tech Transfer**

# Passive New UV Polarimeter for Remote Surface and Atmospheric Sensing, Phase I

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Optical Coating Solutions, Inc. | Lead Organization | Industry<br>Women-Owned Small Business (WOSB) | Camarillo, California |
| Ames Research Center(ARC) | Supporting Organization | NASA Center | Moffett Field, California |

| Primary U.S. Work Locations | |
|---|---|
| California | Idaho |

## Project Transitions

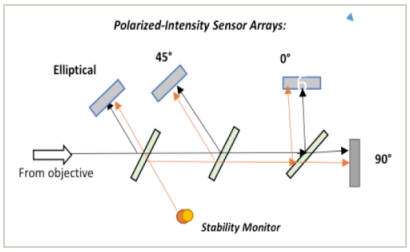
**June 2016:** Project Start

**December 2016:** Closed out

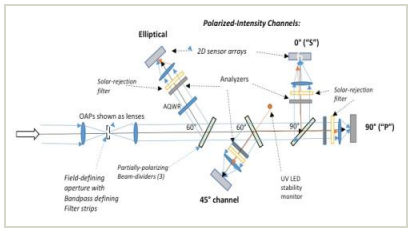
**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/139649)*

## Images




**Briefing Chart Image**
Passive New UV Polarimeter for Remote Surface and Atmospheric Sensing, Phase I *(https://techport.nasa.gov/image/136568)*




**Final Summary Chart Image**
Passive New UV Polarimeter for Remote Surface and Atmospheric Sensing, Phase I Project Image *(https://techport.nasa.gov/image/128589)*

## Organizational Responsibility

**Responsible Mission Directorate:**
Space Technology Mission Directorate (STMD)

**Lead Organization:**
Optical Coating Solutions, Inc.

**Responsible Program:**
Small Business Innovation Research/Small Business Tech Transfer

## Project Management

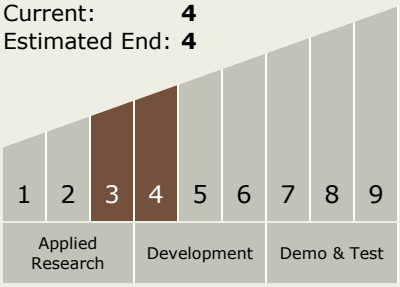
**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Samuel F Pellicori

## Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.3 Optical Components

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System